

WHAT IS CLAIMED IS:

1. An expandable intervertebral implant, comprising:

a body having a longitudinal axis and including first and second axial walls spaced apart along a transverse axis, said first axial wall including a first pair of opposite end portions, said
5 second axial wall including a second pair of opposite end portions, said first pair of end portions interconnected with said second pair of end portions; and

an expansion member co-acting with said first and second axial walls to expand said body along said transverse axis.

- 10 2. The implant of claim 1, wherein said body includes first and second transverse end walls extending between and interconnecting said first pair of end portions with said second pair of end portions.

- 15 3. The implant of claim 2, wherein said first and second axial walls are formed integral with said first and second transverse end walls to define a unitary body.

4. The implant of claim 1, wherein said body has a generally rectangular axial cross-section.

- 20 5. The implant of claim 1, wherein expansion of said body comprises outward deformation of said first and second axial walls along said transverse axis.

6. The implant of claim 5, wherein said outward deformation of said first and second

axial walls defines a convex outer curvature extending along said longitudinal axis.

7. The implant of claim 1, wherein said body defines an inner chamber sized to receive said expansion member therein; and

5 wherein movement of said expansion member within said inner chamber engages said expansion member with said first and second axial walls to expand said body along said transverse axis.

8. The implant of claim 7, wherein said expansion member is positioned within a
10 central portion of said inner chamber to expand said body along said transverse axis.

9. The implant of claim 7, wherein said movement of said expansion member within said inner chamber comprises axial displacement generally along said longitudinal axis.

15 10. The implant of claim 9, wherein said first and second axial walls have inner surfaces facing said inner chamber, at least one of said inner surfaces defining a recessed area for receiving said expansion member upon expansion of said body along said transverse axis.

11. The implant of claim 10, wherein said inner surfaces of said first and second axial
20 walls define opposing recessed areas for receiving said expansion member upon expansion of said body along said transverse axis.

12. The implant of claim 10, wherein said recessed area retains said expansion member in a select axial position upon expansion of said body along said transverse axis.

13. The implant of claim 12, wherein said select axial position is adjacent a central
5 portion of said inner chamber.

14. The implant of claim 9, wherein said first and second axial walls have inner surfaces facing said inner chamber, said inner surfaces defining an inward taper along said longitudinal axis, said expansion member engaging said inward taper to expand said body along
10 said transverse axes as said expansion member is displaced generally along said longitudinal axis.

15. The implant of claim 14, wherein said inner surfaces of said first and second axial walls include opposing ramp portions defining said inward taper.

15 16. The implant of claim 9, wherein at least one of said first and second axial walls includes a retention element adapted to engage and retain said expansion member in a select axial position upon expansion of said body along said transverse axis.

17. The implant of claim 1, wherein body defines an inner fusion chamber; and
20 further comprising a bone growth promoting substance positioned within said inner chamber to facilitate fusion with adjacent vertebral bodies.

18. The implant of claim 17, wherein each of said first and second axial walls defines

at least one bone in-growth opening extending therethrough and communicating with said inner fusion chamber.

19. The implant of claim 17, wherein said expansion member is positioned within a
5 central portion of said inner chamber to expand said body along said transverse axis, said bone growth promoting substance positioned within first and second end portions of said inner chamber on opposite sides of said expansion member.

20. The implant of claim 19, wherein each of said first and second axial walls defines
10 a first bone in-growth opening extending therethrough and communicating with said first end portion of said inner fusion chamber, and a second bone in-growth opening extending therethrough and communicating with said second end portion of said inner fusion chamber.

21. The implant of claim 17, wherein said bone growth promoting substance
15 comprises a bone morphogenic protein.

22. The implant of claim 1, wherein an outer surface of each of said first and second axial walls includes a number of anchor elements adapted to engage adjacent vertebral bodies.

20 23. The implant of claim 22, wherein said anchor elements comprise at least one row of teeth extending from said outer surface of each of said first and second axial walls.

24. The implant of claim 23, wherein positioning of said at least one row of teeth is

confined to a central portion of said outer surface.

25. The implant of claim 24, wherein said anchor elements comprise at least one groove formed in said outer surface of each of said first and second axial walls.

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26. The implant of claim 25, wherein said anchor elements comprise a plurality of grooves formed in said outer surface of each of said first and second axial walls.

27. The implant of claim 25, wherein said at least one groove has an arcuate
10 configuration.

28. The implant of claim 1, wherein said body comprises a pair of opposite end portions having a first width and a central portion having a second width greater than said first width.

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29. The implant of claim 1, wherein said body defines an inner chamber sized to receive said expansion member therein; and

wherein axial displacement of said expansion member within said inner chamber engages said expansion member with said first and second axial walls to expand said body along said
20 transverse axis; and

wherein said expansion member comprises an elongate pin having a length extending substantially entirely across a width of said inner chamber.

30. An expandable intervertebral implant, comprising:

a body having a longitudinal axis and including first and second axial walls spaced apart along a transverse axis, said body including first and second transverse end walls extending between and interconnecting opposing end portions of said first and second axial walls; and
5 means for expanding said first and second axial walls along said transverse axis.

31. An expandable intervertebral implant, comprising:

a body having a longitudinal axis and including first and second axial walls extending generally along said longitudinal axis and spaced apart along a transverse axis; and

10 an expansion member co-acting with said first and second axial walls to expand said body along said transverse axis such that said first and second axial walls are outwardly deformed to define a convex outer curvature along said longitudinal axis.

32. The implant of claim 31, wherein said body includes first and second transverse

15 end walls extending between and interconnecting opposing end portions of said first and second axial walls.

33. The implant of claim 31, wherein said body defines an inner chamber sized to receive said expansion member therein; and

20 wherein movement of said expansion member within said inner chamber engages said expansion member with said first and second axial walls to outwardly deform said first and second axial walls along said transverse axis.

34. The implant of claim 33, wherein said movement of said expansion member within said inner chamber comprises axial displacement generally along said longitudinal axis.

35. The implant of claim 34, wherein said expansion member is positioned within a
5 central portion of said inner chamber to outwardly deform said first and second axial walls along said transverse axis.

36. The implant of claim 34, wherein each of said first and second axial walls defines at least one bone in-growth opening extending therethrough and communicating with said inner
10 chamber; and

further comprising a bone growth promoting substance positioned within said inner chamber to facilitate fusion with adjacent vertebral bodies.

37. An expandable intervertebral implant, comprising:
15 a body having a longitudinal axis and including first and second axial walls spaced apart along a transverse axis, said body including first and second transverse end walls extending between and interconnecting opposing end portions of said first and second axial walls; and
an expansion member co-acting with said first and second axial walls to transition said body from an initial configuration to an expanded configuration wherein said first and second
20 axial walls are outwardly deformed away from one another along said transverse axis.

38. The implant of claim 37, wherein said first and second axial walls define a convex outer curvature along said longitudinal axis when transitioned to said expanded configuration.

39. The implant of claim 38, wherein said body defines an inner chamber sized to receive said expansion member therein; and

wherein movement of said expansion member within said inner chamber engages said expansion member with said first and second axial walls to transition said body to said expanded configuration.

40. The implant of claim 39, wherein said movement of said expansion member within said inner chamber comprises axial displacement generally along said longitudinal axis.

41. The implant of claim 37, wherein said expansion member is positioned within a central portion of said inner chamber to outwardly deform said first and second axial walls along said transverse axis

42. The implant of claim 39, wherein each of said first and second axial walls defines at least one bone in-growth opening extending therethrough and communicating with said inner chamber; and

further comprising a bone growth promoting substance positioned within said inner chamber to facilitate fusion with adjacent vertebral bodies.

43. The implant of claim 42, wherein said bone growth promoting substance comprises a bone morphogenic protein.

44. The implant of claim 39, wherein at least one of said transverse end walls defines a tool receiving opening in communication with said inner chamber and sized to receive portion of a surgical instrument therethrough for engagement with said expansion member.

5 45. An expandable intervertebral implant, comprising:

a fusion cage having a longitudinal axis and including first and second axial walls extending generally along said longitudinal axis and spaced apart along a transverse axis, said fusion cage defining an inner chamber having a central portion and opposite first and second end portions;

10 an expansion member positioned within said central portion of said inner chamber and contacting with said first and second axial walls to expand said fusion cage along said transverse axis; and

a bone growth promoting material positioned within said first and second end portions of said inner chamber on opposite sides of said expansion member.

15 46. The implant of claim 45, wherein each of said first and second axial walls defines a first bone in-growth opening extending therethrough and communicating with said first end portion of said inner chamber, and a second bone in-growth opening extending therethrough and communicating with said second end portion of said inner chamber.

20 47. The implant of claim 45, wherein said bone growth promoting substance comprises a bone morphogenic protein.

48. The implant of claim 45, wherein expansion of said body comprises outward deformation of said first and second axial walls along said transverse axis.

49. The implant of claim 48, wherein said outward deformation of said first and
5 second axial walls defines a convex outer curvature extending along said longitudinal axis.

50. A surgical method, comprising:

providing an expandable intervertebral implant having a longitudinal axis and including first and second axial walls spaced apart along a transverse axis, the body including first and
10 second transverse end walls extending between and interconnecting opposing end portions of the first and second axial walls;

inserting the intervertebral implant within an intervertebral space with the first and second axial walls positioned adjacent respective first and second vertebral bodies; and

expanding the first and second axial walls along the transverse axis to engage the first and
15 second axial walls against the respective first and second vertebral bodies.

51. The method of claim 50, wherein the intervertebral implant defines an inner chamber extending along the longitudinal axis; and

further comprising positioning a bone growth promoting material within the inner
20 chamber.

52. The method of claim 50, wherein the intervertebral implant defines an inner chamber extending along the longitudinal axis; and

wherein the expanding results from moving the expansion member within the inner chamber.

53. The method of claim 52, wherein the inner chamber has a central portion and
5 opposite first and second end portions; and

wherein moving the expansion member within the central portion of the inner chamber results in the expanding of the first and second axial walls along the transverse axis.

54. The method of claim 53, further comprising positioning a bone growth promoting
10 material within the first and second end portions of the inner chamber on opposite sides of the expansion member.

55. The method of claim 54, wherein each of the first and second axial walls defines a
first bone in-growth opening extending therethrough and communicating with the first end
15 portion of the inner chamber, and a second bone in-growth opening extending therethrough and communicating with the second end portion of the inner chamber.

56. The method of claim 50, wherein the expanding comprises outwardly deforming
the first and second axial walls to define a convex outer curvature extending along the
20 longitudinal axis.

57. The method of claim 50, wherein each of the first and second axial walls includes
a mid-portion and first and second end portions disposed adjacent the first and second transverse

end walls; and

wherein the expanding comprises outwardly deforming the first and second axial walls away from one other such that expansion of the mid-portions of the first and second axial walls is greater than expansion of the end portions of the first and second axial walls.

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58. The method of claim 50, further comprising preparing a disc space between the first and second vertebral bodies prior to the insertion including removing a portion of the cortical bone from each of the first and second vertebral bodies to expose cancellous bone tissue while substantially maintaining the cortical rim region intact; and

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wherein the expanding engages the first and second axial walls against the exposed cancellous bone tissue of the first and second vertebral bodies.

59. The method of claim 58, wherein the inserting includes positioning upper and lower bearing surfaces of the first and second transverse end walls adjacent the cortical rim region of the first and second vertebral bodies.

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60. The method of claim 58, wherein the removing of cortical bone comprises forming a concave recess in each of the adjacent vertebral bodies; and

wherein the expanding comprises outwardly deforming each of the first and second axial walls to define a convex outer curvature received within the concave recess of a respective one of the first and second vertebral bodies.

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